REMARKS

Applicants' Amendments

Applicants have amended their claims as follows. Previously presented claims 28, 30 and 35 have been amended to clarify that the limitations recited in the claims relate to the ratio of the maximum average diameter of the added microspheroidal particle fines to the mean diameter of the resulting microspheroidal particles. The claims are further amended to clarify the ranges claimed for the ratios. For claims 28 and 35, the range for the claimed ratios is amended to be from about 0.01 to about 0.6 rather than 0.01 to 0.6 recited in the claims as presented. Similarly, the range for the ratio in claim 30 is amended to be from about 0.1 to about 0.4 rather than from 0.1 to 0.4. New claim 44 is added to the application to specify the range of the ratio to be from about 0.05 to about 0.5. New claim 44 is otherwise similar to claim 28 as amended. Support for the amendments is found at page 9, lines 23 – 28 of the specification.

Claims 21 and 31 are amended to clarify that the slurries from which the particles of the invention are made are made in the absence of catalytic metals. As described in the specification, catalytic metals are applied to the pore structure of the particles after the particles are formed. Support for the amendments is found throughout the application.

Claim 42 has been amended to better clarify that the catalytic metals can be selected from gold, palladium or mixtures thereof. Support for the amendment can be found at page 4, lines 20 – 22 of the specification. Claim 43 has been amended to correct a simple spelling error and to clarify that acetic acid as well as ethylene, oxygen and the catalyst component can be contacted in a fluidized bed under acetoxylation conditions to produce vinyl acetate. Support for the latter can be found at page 13, lines 12 – 14 of the specification. Hence, the amendments add no new matter to the application.

Status of the Application

Original claims 1 – 20 were previously cancelled from the application. Claims 21 – 43 are pending in the application. Claims 21 – 43 stand rejected. Claim 44 is newly added to the application.

Pending Claims 28, 30 and 35 have been rejected under 35 USC 112, second paragraph as indefinite. As presented, the claims recite "the average diameter of the added

microspheroidal particle fines is ... of the mean diameter of the resulting microspheroidal particles". The Examiner found the recitation indefinite and confusing because no units are recited with the diameter

Claims 21 – 43 have been rejected under 35 USC 102(b) as unpatentable over US 3,816,342 (Plank). Plank is said to disclose a method for fluid catalytic cracking (FCC) of hydrocarbons using a composite catalyst of highly active aluminosilicate and a matrix material and recycled fines as claimed. The fines added to the aluminosilicate and matrix may be of a size up to about 40 microns weight mean particle diameter. Further, Plank is cited for the disclosure that "special advantage may be gained also by the addition of fines below about 7 microns and preferably in the size range of from 0.3 to 3.0 microns." The composition is said to be used for attrition resistant particles used for FCC of hydrocarbons. The Examiner asserts that the prior art disclosures have the features and characteristics as claimed.

Brief Description of the Invention

Before addressing the outstanding rejections, Applicants believe it would be useful to briefly describe the substance of the invention. Applicants have developed novel and useful microspheroidal particles and methods for making them. The particles of the invention are made by collecting smaller, less desirable fine particles that result in the production process and recycling those less desirable particles in a aqueous slurry comprising a metal oxide sol and an inorganic particulate sol. The slurry is spray dried to produce microspheroidal particles, which are separated and dried. The microspheroidal particles are made in the absence of catalytic metals, which are applied to the porous structure of the particles after the particles have been made.

Applicants believe the superior attrition resistance results from increased hardness in the particles that results because, in the absence of materials such as catalyst, the recycled fines are able to "seed" the formation of more uniform and, hence, stronger particles.

The microspheroidal particles of the invention are advantageously used as supports for fluidized bed catalysts. Catalytic metals are applied to the pore structure of the particles. For example, precious metal catalytic materials such as gold and palladium are impregnated into the pore structure of Applicants' particles for use in acetoxylation. The superior attrition resistance of Applicants' particles is clearly demonstrated in Applicants' examples and Table 1. The enhanced attrition resistance provided by Applicants' novel particles provides a substantial advantage in reducing the loss of such these precious catalytic metals during the catalytic cycle.

Applicants have found their particles to be superior to those particles available commercially and, in fact, Applicants' particles are used commercially.

Response to the Rejections

Applicants respectfully traverse the rejection for reasons discussed herein. Applicants submit the rejections of claims 28, 30 and 35 have been overcome by Applicants' amendments herein. Applicants submit the claims are no longer confusing and, hence, now satisfy 35 USC 112, second paragraph.

Applicants further submit their claims are not anticipated or rendered obvious by the disclosure of Plank. As discussed above, Applicants' claimed particles are made in the absence of catalytic metals by spray drying an aqueous slurry comprising a metal oxide sol, an inorganic particulate solid, and a minor portion of microspheroidal particle fines to form the particles of the invention. The particles are then separated and dried. As described in the specification, catalytic metals are applied to the pore structure of the particles after the particles have been formed. In contrast, the materials disclosed in Plank are made integrating aluminosilicate catalysts, binder and other materials in a gel matrix followed by the formation of beads, which are then further processed to form catalyst particles. ("[Such methods generally comprise incorporating finely divided particles of aluminosilicate into a matrix component ...." Col. 9, line 30 et seq.]

Plank does not disclose or suggest the preparation of microspheroidal particles in the absence of catalytic metals. Plank does not disclose or suggest that improved attrition resistance in such particles will result from such a process. Indeed, Plank merely asserts increased attrition resistance for his particles but does not provide any evidence to support this assertion, or demonstrate the extent of enhanced attrition resistance or that there is any improvement at all. In contrast, Applicants show substantial increased attrition resistance for their particles in their examples and Table 1. Accordingly, Applicants' particles are clearly distinguishable and patentable from those disclosed in Plank.

In view of the foregoing and the amendments made herein, Applicants submit that all of claims 21 – 44 now pending in the application are patentable over the cited art. Applicants submit that their application is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,

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